Trend Study 19B-8-02

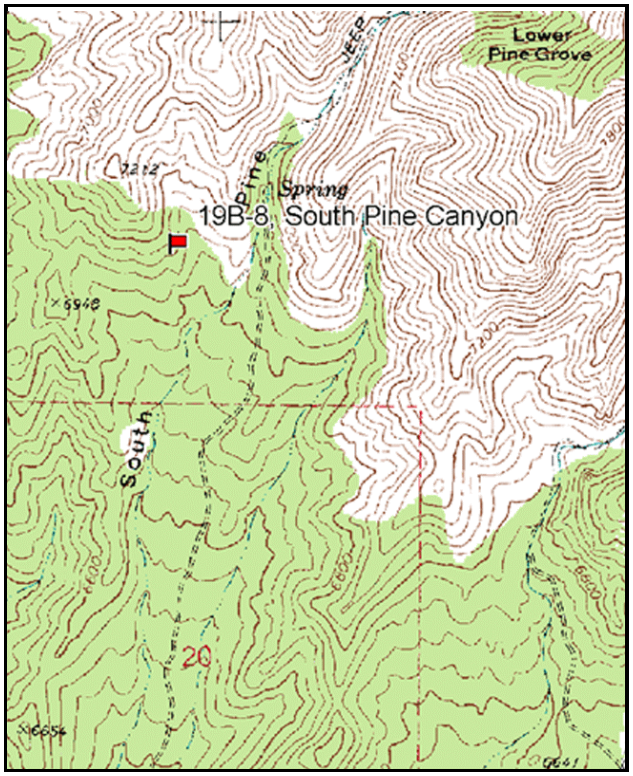
Study site name: South Pine Canyon . Vegetation type: Mountain Brush .

Compass bearing: frequency baseline 149 degrees magnetic.

Frequency belt placement: line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft) and line 4 (71ft).

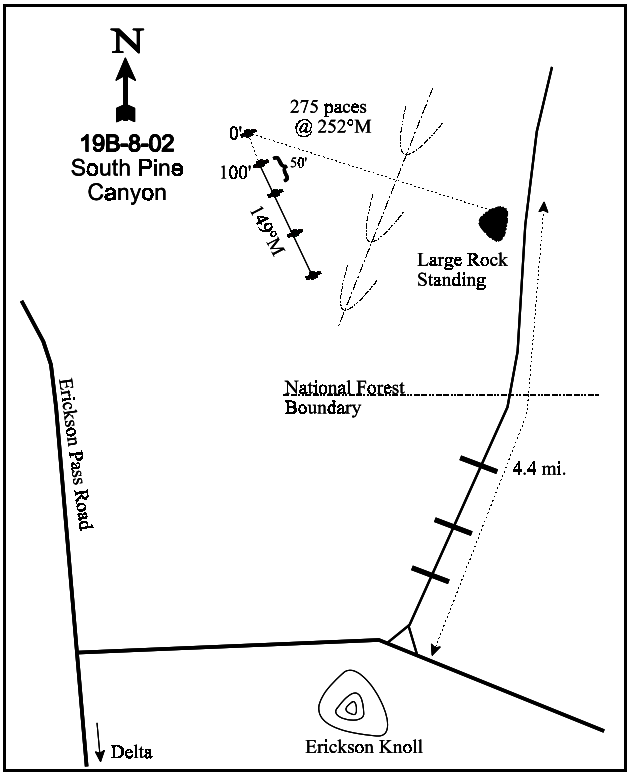
LOCATION DESCRIPTION

Starting on the road north of Erickson Knoll (road #564), take the South Pine Canyon Rd north for 4.4 Miles. In route, you will pass through a series of four gates and the National Forest Service boundary. Stop next to a huge rock on the west side of the road. From the west side of the road, the 0-foot baseline stake is 250 paces away at 317 degrees magnetic (across South Pine wash). The 0-foot baseline is marked by browse tag #3976.



Map Name: Erickson Knoll

Township 10S , Range 6W , Section 17



Diagrammatic Sketch

GPS: NAD 27, UTM 12S 4423318 N 368150 E

DISCUSSION

South Pine Canyon - Trend Study No. 19B-8

The South Pine Canyon study is located on Forest Service administered land and samples important deer winter range. The site slopes moderately to the south at an elevation of 6,900 feet. This study was not sampled during the 1997 rotation because a recent wildfire had eliminated all of the browse on the site. Prior to the burn, the site consisted of a mountain brush community with a sparse herbaceous understory. No information was available for wildlife use prior to the burn. Deer use on the site appears moderate following the fire. A pellet group transect read on site in 2002 estimated 55 deer days use/acre (136 ddu/ha). Most of the use appeared to be from late winter and spring use. Cattle were grazing in the vicinity when the site was read in 2002. Livestock use was estimated at six days use/acre (14 cdu/ha) on the immediate site.

Soil is sandy loam in texture and neutral in reactivity (pH of 7.1). Soils are rocky and well drained with little evidence of any topsoil development. Rock and pavement combined to cover 38% of the soil surface in 2002. The profile is also very rocky throughout. Effective rooting depth was estimated at just over 11 inches in 2002 with an average soil temperature of 67°F at 11 inches in depth. It was reported in the past that there were signs of significant sheet and gully erosion. In 2002, an erosion condition class assessment showed soils to be stable. Litter and vegetation cover are lacking, but the abundance of rock and pavement armor the surface. Bare ground was estimated at 27% in 2002, an increase from 19% in 1989. Pedestalling of plants was common prior to the burn.

The key browse prior to and following the burn are Saskatoon serviceberry, antelope bitterbrush, and mountain big sagebrush. Each of these species have lower densities in 2002 compared to 1983 and 1989. Between the 1989 and 2002 readings, two events occurred that resulted in these density changes. First, the wildfire that burned through the area likely accounted for some of the loss. Second, the baseline was expanded in 2002 and shrub densities were determined using strips instead of the old circular plots. This more than tripled the sample size used to determine shrub densities, so some of the change may be due to this as well. Serviceberry density was estimated at 320 plants/acre in 2002. Use was heavy. The population showed poor vigor with percent decadence rated as moderate at respectively 38% and 31% of the population. No young were sampled in 2002. Mormon crickets had done some defoliating on serviceberry in 2002. Mountain big sagebrush density was estimated at 100 plants/acre in 2002. Forty percent of the sagebrush sampled were young plants, vigor was normal, use light to moderate, and no decadent plants were sampled. Bitterbrush density was estimated at only 60 mature plants/acre in 2002. All plants sampled were heavily utilized, but vigor was normal and there were no decadent plants. Annual leader growth for serviceberry, bitterbrush, and mountain big sagebrush averaged respectively 1.3 inches, 2.5 inches, and 2.1 inches in 2002.

As noted above, the understory was rather sparse before the fire, and is even more so now. Prior to the burn, the grass component was composed of only three perennial species. These included bluebunch wheatgrass, mutton bluegrass, and Sandberg bluegrass. An additional grass, sand dropseed, was sampled in 2002. All species of perennial grasses were sampled in only one quadrat in the 2002 reading, with the exception of bluebunch wheatgrass, which had a quadrat frequency of 16%. Cheatgrass brome was the most abundant grass sampled in 2002 as it provided 85% of the grass cover, and 64% of the total vegetation cover on the site. Cheatgrass was uniformly distributed over the site, but was small statured in 2002. Cattle were reported to have heavily grazed the limited wheatgrass plants on the site in the past.

Forbs had fair compositional diversity in 1983 and 1989, but provided little forage or ground cover. The most common species were American vetch, wild onion, spring parsley, longleaf phlox, and thistle. All are poor to medium value forage plants. More desirable species such as redroot eriogonum, tapertip hawksbeard, and gray lomatium occurred infrequently. With drought in 2002, forbs were insignificant on the site. The perennial forbs had a 93% decline in sum of nested frequency between 1989 and 2002.

1983 APPARENT TREND ASSESSMENT

Soil trend appears to be declining because of excessive erosion and sedimentation. This in turn, prevents any significant buildup of litter and inhibits seedling establishment of more desirable plants. Although the browse trend appears more stable, some discouraging signs are apparent; most notably heavy use on the key browse species. The herbaceous cover is sparse but appears to be stable at this time.

1989 TREND ASSESSMENT

Protective ground cover values have stayed relatively the same between readings. Soil erosion does not appear to be any worse leading to a stable soil trend. Although there are signs of moderate to heavy use on all species. The bitterbrush population declined in density, while the other key browse populations appear to be stable. The browse trend is stable, although grazing pressures should be reduced on these species. The herbaceous understory is lacking. Very little forage or cover is contributed by forbs or grasses. The herbaceous understory trend is slightly up as the sum of nested frequency for perennial forbs has increased since 1983.

TREND ASSESSMENT
soil - stable (3)
browse - stable (3)
herbaceous understory - slightly up (4)

2002 TREND ASSESSMENT

Trend for soil is down. Bare soil increased from 19% to 27%, and litter cover decreased from 63% to 27%. Vegetation cover is low and provided by herbaceous species, mostly from cheatgrass. The ratio of protective cover (vegetation and litter) to bare soil is poor at only 2:1. Trend for browse is down. Densities of all the key species have declined since 1989, due at least in part to a wildfire that burned through the site. Use remains heavy on bitterbrush and serviceberry, whereas moderate on mountain big sagebrush. Recruitment by young plants is low for all species, so increased populations in the future is unlikely especially with the current drought cycle. The herbaceous understory trend is down. The understory was reportedly sparse prior to the burn and is even more so in 2002 with drought. Sum of nested frequency for all perennial grasses and forbs declined by 87% between 1989 and 2002.

TREND ASSESSMENT
soil - down (1)
browse - down (1)
herbaceous understory - down (1)

HERBACEOUS TRENDS --
Herd unit 19B, Study no: 8

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %
		'83	'89	'02	'83	'89	'02	'02
G	Agropyron spicatum	$_{b}$90	$_{b}$90	$_{a}$33	41	36	16	1.70
G	Bromus tectorum (a)	-	-	290	-	-	94	9.86
G	Poa fendleriana	1	9	3	1	4	1	.03
G	Poa secunda	$_{b}$13	$_{b}$15	$_{a}$1	7	7	1	.01
G	Sporobolus cryptandrus	-	-	2	-	-	1	.03
Total for Annual Grasses		0	0	290	0	0	94	9.86
Total for Perennial Grasses		104	114	39	49	47	19	1.77
Total for Grasses		104	114	329	49	47	113	11.63
F	Agoseris glauca	5	-	-	3	-	-	-
F	Allium spp.	$_{c}$54	$_{b}$29	$_{a}$-	26	13	-	-
F	Arabis spp.	-	11	-	-	4	-	-
F	Arenaria spp.	-	3	-	-	1	-	-
F	Artemisia ludoviciana	11	7	-	4	2	-	-
F	Astragalus spp.	3	2	-	2	1	-	-
F	Calochortus nuttallii	-	2	-	-	1	-	-
F	Chaenactis douglasii	$_{a}$1	$_{b}$21	$_{a}$1	1	9	1	.00
F	Cirsium spp.	13	7	9	7	4	6	.45
F	Comandra pallida	$_{ab}$7	$_{b}$11	$_{a}$-	3	5	-	-
F	Crepis acuminata	$_{b}$18	$_{b}$24	$_{a}$-	9	12	-	-
F	Cryptantha spp.	$_{ab}$18	$_{b}$20	$_{a}$2	7	9	1	.03
F	Cymopterus longipes	$_{b}$29	$_{a}$-	$_{a}$-	16	-	-	-
F	Descurainia pinnata (a)	-	3	-	-	2	-	-
F	Erodium cicutarium (a)	-	-	14	-	-	8	.21
F	Eriogonum racemosum	2	-	-	1	-	-	-
F	Hackelia patens	12	12	-	5	4	-	-
F	Lactuca serriola	$_{a}$-	$_{a}$-	$_{b}$10	-	-	5	.13
F	Lithospermum ruderale	5	5	5	2	3	3	.24
F	Lomatium grayi	$_{b}$11	$_{c}$77	$_{a}$-	7	36	-	-
F	Machaeranthera canescens	2	3	-	2	1	-	-
F	Phlox longifolia	$_{a}$2	$_{b}$45	$_{a}$3	1	22	1	.00
F	Sanguisorba minor	-	-	2	-	-	1	.03
F	Tragopogon dubius	-	4	-	-	2	-	-
F	Vicia americana	$_{b}$140	$_{c}$155	$_{a}$-	57	60	-	-
F	Viola spp.	1	-	-	1	-	-	-
Total for Annual Forbs		0	3	14	0	2	8	0.21
Total for Perennial Forbs		334	438	32	154	189	18	0.90
Total for Forbs		334	441	46	154	191	26	1.11

Values with different subscript letters are significantly different at alpha = 0.10

BROWSE TRENDS --
Herd unit 19B, Study no: 8

Type	Species	Strip Frequency '02	Average Cover % '02
B	Amelanchier alnifolia	13	1.45
B	Artemisia tridentata vaseyana	5	.33
B	Chrysothamnus viscidiflorus viscidiflorus	7	.56
B	Mahonia repens	2	.06
B	Opuntia spp.	1	-
B	Purshia tridentata	3	.38
B	Tetradymia canescens	1	-
Total for Browse		32	2.78

CANOPY COVER -- LINE INTERCEPT
Herd unit 19B, Study no: 8

Species	Percent Cover '02
Amelanchier alnifolia	2.75
Artemisia tridentata vaseyana	1.08
Chrysothamnus viscidiflorus viscidiflorus	.83
Purshia tridentata	.42

Key Browse Annual Leader Growth
Herd unit 19B , Study no: 8

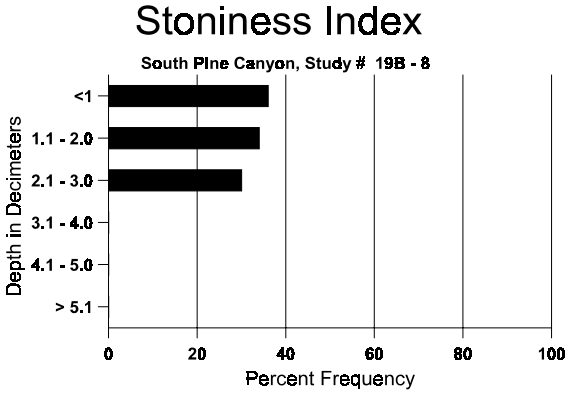
Species	Average leader growth (in) '02
Artemisia tridentata vaseyana	2.1
Purshia tridentata	2.5

BASIC COVER --
Herd unit 19B, Study no: 8

Cover Type	Nested Frequency '02	Average Cover % '83	'89	'02
Vegetation	302	2.75	6.25	15.07
Rock	297	6.75	9.50	13.52
Pavement	376	1.75	2.75	24.91
Litter	358	65.25	62.75	27.26
Cryptogams	-	.25	.25	0
Bare Ground	329	23.25	18.50	26.89

SOIL ANALYSIS DATA --
Herd Unit 19B, Study no: 8, South Pine Canyon

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
11.4	67.0 (11.7)	7.1	69.3	16.7	14.0	2.5	13.8	227.2	0.6



PELLET GROUP FREQUENCY --
Herd unit 19B, Study no: 8

Type	Quadrat Frequency '02	Pellet Transect	
		Pellet Groups per Acre ⁄02	Days Use per Acre (ha) ⁄02
Rabbit	1	-	-
Deer	20	713	55 (136)
Cattle	5	70	6 (14)

BROWSE CHARACTERISTICS --
Herd unit 19B, Study no: 8

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Amelanchier alnifolia																		
Y	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	1	-	-	1	-	-	-	-	-	2	-	-	-	133			2
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	83	-	-	12	-	-	-	-	-	-	12	-	-	-	800	45	53	12
	89	-	10	-	-	-	-	-	-	-	10	-	-	-	666	45	48	10
	02	-	-	7	-	-	3	-	-	1	10	-	1	-	220	21	44	11
D	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	1	1	-	-	-	-	-	-	-	2	-	-	-	133			2
	02	-	-	-	-	-	-	2	-	3	-	-	-	5	100			5

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	100%	00%	+14%
'89	79%	00%	00%	-66%
'02	00%	88%	38%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'83	800	Dec:	0%
	'89	932		14%
	'02	320		31%

Artemisia tridentata vaseyana																		
Y	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
M	83	3	3	-	-	-	-	-	-	-	6	-	-	-	400	28	36	6
	89	3	5	-	-	-	-	-	-	-	7	-	1	-	533	11	13	8
	02	1	2	-	-	-	-	-	-	-	3	-	-	-	60	20	34	3
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	200			10

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	50%	00%	00%	+25%
'89	63%	00%	13%	-81%
'02	40%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'83	400	Dec:	-
	'89	533		-
	'02	100		-

Atriplex canescens																		
M	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0	10	22	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	00%	00%	
'89	00%	00%	00%	
'02	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'83	0	Dec:	-
	'89	0		-
	'02	0		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Chrysothamnus viscidiflorus viscidiflorus																		
Y	83	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	83	3	-	-	-	-	-	-	-	-	3	-	-	-	200	14	10	3
	89	4	-	-	-	-	-	-	-	-	4	-	-	-	266	9	9	4
	02	10	1	-	-	-	-	-	-	-	11	-	-	-	220	15	33	11
D	83	1	-	-	-	-	-	-	-	-	-	1	-	-	66			1
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	00%	00%	-20%
'89	00%	00%	00%	-17%
'02	09%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'83	332	Dec:	20%
	'89	266		0%
	'02	220		0%

Gutierrezia sarothrae																		
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	00%	00%	
'89	00%	00%	00%	
'02	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'83	0	Dec:	-
	'89	0		-
	'02	0		-

Juniperus osteosperma																		
M	83	-	-	-	1	-	-	-	-	-	1	-	-	-	66	67	173	1
	89	-	-	-	1	-	-	-	-	-	1	-	-	-	66	197	157	1
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	00%	00%	+ 0%
'89	00%	00%	00%	
'02	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'83	66	Dec:	-
	'89	66		-
	'02	0		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Mahonia repens																		
Y	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
M	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	02	9	-	-	-	-	-	-	-	-	1	-	8	-	180	2	6	9

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	00%	00%	
'89	00%	00%	00%	
'02	00%	00%	80%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'83	0	Dec:	-
	'89	0		-
	'02	200		-

Opuntia spp.																		
Y	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	3	-	-	-	-	-	-	-	-	3	-	-	-	200			3
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	83	13	-	-	-	-	-	-	-	-	13	-	-	-	866	10	17	13
	89	9	-	-	-	-	-	-	-	-	3	-	6	-	600	7	28	9
	02	1	-	-	-	-	-	-	-	-	1	-	-	-	20	6	18	1
D	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	1	-	-	-	-	-	-	-	-	1	66			1
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	00%	00%	+ 0%
'89	00%	00%	54%	-98%
'02	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'83	866	Dec:	0%
	'89	866		8%
	'02	20		0%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Purshia tridentata																		
M	83	-	1	23	-	-	-	-	-	-	24	-	-	-	1600	17	25	24
	89	-	6	10	-	-	-	-	-	-	16	-	-	-	1066	14	31	16
	02	-	-	1	-	-	2	-	-	-	3	-	-	-	60	8	24	3
D	83	-	-	1	-	-	-	-	-	-	1	-	-	-	66			1
	89	-	-	2	-	-	-	-	-	-	2	-	-	-	133			2
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	04%	96%	00%	-28%
'89	33%	67%	00%	-95%
'02	00%	100%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'83	1666	Dec:	4%
'89	1199		11%
'02	60		0%

Tetradymia canescens																		
Y	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	-	1	-	-	-	-	-	-	-	1	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	00%	00%	
'89	00%	00%	00%	
'02	100%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)			
'83	0	Dec:	-
'89	0		-
'02	20		-